AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A monitoring unit ~~[10]~~ for monitoring the condition of a semi-permeable membrane ~~[24]~~, the monitoring unit ~~[10]~~ comprising a flow chamber ~~[12]~~ having an inlet for permitting ingress of a feed fluid into the flow chamber ~~[12]~~, the arrangement being such that the membrane ~~[24]~~ is at least partly supported in the flow chamber ~~[12]~~: at least one fluid outlet ~~[18]~~ arranged in fluid communication with the flow chamber ~~[12]~~ for permitting egress of fluid from the monitoring unit ~~[10]~~ after having passed through the membrane ~~[24]~~; and an inspection window ~~[20]~~ for permitting visual inspection of the semi-permeable membrane ~~[24]~~.

2. (Currently amended) The monitoring unit ~~[10]~~ according to claim 1 wherein the monitoring unit ~~[10]~~ is particularly adapted for monitoring fouling of the semi-permeable membrane ~~[24]~~.

3. Canceled

4. (Currently amended) The monitoring unit ~~[10]~~ according to ~~claims 1 and 3~~ claim 1 further including a feed fluid outlet and wherein the flow chamber ~~[12]~~ is dimensioned such that a fluid pressure interval is defined intermediate the feed fluid inlet ~~[14]~~ and the feed fluid outlet ~~[22]~~.

5. (Currently amended) The monitoring unit ~~[10]~~ according to claim 4 wherein the fluid pressure at the feed fluid outlet ~~[22]~~ is less than that at the feed fluid inlet ~~[14]~~ such that, in use, the feed fluid partly exits through the feed fluid outlet ~~[22]~~ of the flow chamber ~~[12]~~ and in part passes through the semi-permeable membrane ~~[24]~~.

6. (Currently amended) The monitoring unit ~~[10]~~ according to claim 1 wherein the monitoring unit ~~[10]~~ comprises a fluid permeable support member ~~[16]~~ for supporting the semi-permeable membrane ~~[24]~~ in the flow chamber ~~[12]~~.

7. (Currently amended) The monitoring unit ~~[10]~~ according to claim 6 wherein the support member ~~[16]~~ constitutes a base portion of the flow chamber ~~[12]~~, the arrangement being such that feed fluid entering the flow chamber ~~[12]~~ passes at least in part through the support member ~~[16]~~.

8. (Currently amended) The monitoring unit ~~[10]~~ according to ~~claims 6 and 7~~ either claim 6 or claim 7 wherein the support member ~~[16]~~ is of any suitable porous material such as high-density polyethylene, stainless steel, brass, finely woven fiber ~~or the like~~.

9. (Currently amended) The monitoring unit ~~[10]~~ according to ~~claims 6 to~~ claim 8 wherein the support member [16] include pores of pore sizes between 10 and 150 μm.

10. (Currently amended) The monitoring unit ~~[10]~~ according to claim 1 wherein the monitoring unit ~~[10]~~ includes spacer means for spacing the semi-permeable membrane ~~[24]~~ from the support member ~~[16]~~ so as to provide a flow space between the membrane ~~[24]~~ and the support member ~~[16], or between adjacent membranes on the support member [16]~~.

11. (Currently amended) The monitoring unit ~~[10]~~ according to either claim 10 or claim 45 wherein the monitoring unit ~~[10]~~ accommodates different ~~spacers~~ spacer means that vary in thickness and shape, the arrangement being such that fluid dynamics of the feed fluid flowing across the semi-permeable membrane ~~[24]~~ are influenced through the use of different ~~spacers~~ spacer means.

12. (Currently amended) The monitoring unit ~~[10]~~ according to claim 11 wherein the ~~monitoring unit [10] includes either~~ spacer means is a spacer that is locatable intermediate the semi-permeable membrane ~~[24]~~ and the support member ~~[16] that is similar to a permeate-side spacer generally used in construction of spiral wrap elements; and/or includes a feed-side spacer similar to that used in construction of spiral elements in use, wherein the feed-side spacer is locatable on top of the semi-permeable membrane [24]~~.

13. (Currently amended) The monitoring unit ~~[10]~~ according to ~~claims 10 to 12~~ claim 10 wherein adsorption kinetics of fouling substances in the feed fluid are affected by specific spacer configurations, the monitoring unit ~~[10]~~ thus including the potential for evaluating spacer technology because of its potential to include different types of spacers.

14. (Currently amended) The monitoring unit ~~[10]~~ according to ~~claims 1 and~~ claim 6 wherein the fluid outlet ~~[18]~~ is arranged in fluid communication with the support member ~~[16]~~ such that fluid that has passed through the membrane ~~[24]~~ and the support member ~~[16]~~ exits the monitoring unit ~~[10]~~ through the fluid outlet ~~[18]~~.

15. (Currently amended) The monitoring unit ~~[10]~~ according to claim 14 wherein the fluid outlet ~~[18]~~ is arranged in fluid communication with a conduit for passing the fluid through the water purification system.

16. (Currently amended) The monitoring unit ~~[10]~~ according to ~~claims 1 and 6~~ either claim 6 or claim 14 wherein the inspection window ~~[20]~~ is oriented substantially parallel to and ~~somewhat~~ spaced from the support member ~~[16]~~, the arrangement being

such that the flow chamber ~~[12]~~ is defined intermediate the support member ~~[16]~~ and the inspection window ~~[20]~~.

17. (Currently amended) The monitoring unit ~~[10]~~ according to claim 16 wherein the inspection window ~~[20]~~ is of any suitable transparent material, such as plastics, Perspex, glass ~~or the like material~~ characterized therein that it can withstand a pressure of at least between 40 and 50 bar.

18. (Currently amended) The monitoring unit ~~[10]~~ according to claim 1 wherein the monitoring unit ~~[10]~~ includes regulating means for regulating flow across the membrane, as well as fluid pressure in the unit, the regulating means being adapted to permit repeatable or standard conditions, such as a constant cross-flow velocity and fluid pressure.

19. (Currently amended) The monitoring unit ~~[10]~~ according to claim 18 <u>further including a feed fluid outlet and</u> wherein the regulating means is at least one valve arranged for regulating the fluid pressure interval intermediate the feed fluid inlet ~~[14]~~ and the feed fluid outlet ~~[22]~~.

20. (Currently amended) The monitoring unit ~~[10]~~ according to claim 19 wherein the monitoring unit ~~[10]~~ includes at least one feed fluid inlet valve operatively associated with the feed fluid inlet ~~[14]~~; and at least one feed fluid outlet valve operatively associated with the feed fluid outlet ~~[22]~~ of the flow chamber ~~[12]~~.

21. (Currently amended) The monitoring unit ~~[10]~~ according to ~~claims 19 and~~ <u>either claim 19 or claim</u> 20 wherein the monitoring unit ~~[10]~~ includes at least one fluid outlet valve at the fluid outlet ~~[18]~~.

22. (Currently amended) The monitoring unit ~~[10]~~ according to claim 1 wherein the monitoring unit ~~[10]~~ is operatively associated with pumping means for further manipulating fluid pressure in the monitoring unit ~~[10]~~.

23. (Currently amended) The monitoring unit ~~[10]~~ according to claim 22 <u>further including a feed fluid outlet and</u> wherein the monitoring unit ~~[10]~~ is operatively associated with a positive displacement pump arranged in-line with the monitoring unit ~~[10]~~ and suitable for maintaining the fluid pressure interval intermediate the feed fluid inlet ~~[14]~~ and feed fluid outlet ~~[22]~~ of the flow chamber ~~[12]~~.

24. (Currently amended) The monitoring unit ~~[10]~~ according to claim 1 wherein the monitoring unit ~~[10]~~ includes flow distribution means in the form of a manifold ~~[28]~~ dimensioned for preventing turbulence within the flow chamber ~~[12]~~ and for effecting homogenous fluid flow.

25. (Currently amended) The monitoring unit ~~[10]~~ according to claim 24 wherein the monitoring unit ~~[10]~~ includes an inlet manifold ~~[28.1]~~ arranged intermediate the feed fluid inlet ~~[14]~~ and the flow chamber ~~[12]~~ for regulating flow of feed fluid into the flow chamber ~~[12]~~.

26. (Currently amended) The monitoring unit ~~[10]~~ according to claim 24 wherein the monitoring unit ~~[10]~~ includes <u>a feed fluid outlet and</u> an outlet manifold ~~[28.2]~~ located intermediate the flow chamber ~~[12]~~ and the feed fluid outlet ~~[22]~~, the outlet manifold ~~[28.2]~~ being arranged such that it prevents areas of decreased flow in the flow chamber ~~[12]~~ so as to prevent preferential foulant adsorption or biological growth.

27. (Currently amended) The monitoring unit ~~[10]~~ according to ~~claims 25 and~~ <u>either claim 25 or claim</u> 26 wherein the manifolds ~~[28.1; 28.2]~~ are arranged so as to

permit reverse flow through the monitoring unit ~~[10]~~ for evaluating the effectiveness of back flushing on removal of impurities adsorbed onto the membrane ~~[24]~~.

Claims 28 and 29 Canceled.

30. (Currently amended) The monitoring unit ~~[10]~~ according to claim 1 wherein the monitoring unit ~~[10]~~ comprises the potential of simulating, in the monitoring unit ~~[10]~~, conventional fluid dynamics associated with a semi-permeable membrane ~~[24]~~ across the spacer means and support member ~~[16]~~ and is therefore adapted for monitoring fouling of a semi-permeable membrane ~~[24]~~ during operation of a water purification system.

31. (Currently amended) The monitoring unit ~~[10]~~ according to claim 30 wherein the monitoring unit ~~[10]~~ operates at a fluid pressure corresponding to that of the water purification system, and more particularly at a fluid pressure of between 40 and 50 bar.

32. (Currently amended) The monitoring unit ~~[10]~~ according to claim 1 wherein the monitoring unit ~~[10]~~ is located inline with a conventional reverse osmosis water purification system.

33. (Currently amended) The monitoring unit ~~[10]~~ according to claim 32 wherein the monitoring unit ~~[10]~~ is adapted for monitoring fouling of a semi-permeable spiral membrane ~~[24]~~ in a spiral reverse osmosis water purification system and is located intermediate a feed fluid tank and a spiral membrane plant of the spiral reverse osmosis water purification system.

34. (Currently amended) A method of monitoring fouling of a semi-permeable membrane ~~[24]~~ in a water purification system, the method comprising the steps of providing a monitoring unit ~~[10]~~ comprising a flow chamber ~~[12]~~ having an inlet for

permitting ingress of a feed fluid into the flow chamber ~~[12]~~, ~~the arrangement being such that the membrane [24] is at least partly supported in the flow chamber [12]~~; at least one fluid outlet arranged in fluid communication with the flow chamber ~~[12]~~ for permitting egress of fluid from the monitoring unit ~~[10]~~ after having passed through ~~the~~ a semi-permeable test membrane; and an inspection window ~~[20]~~ for permitting visual inspection of the semi-permeable test membrane; placing ~~at least one~~ the semi-permeable test membrane ~~[24]~~ on ~~the~~ a fluid permeable support member; effecting at least partial passage of feed fluid through the test membrane; and visually monitoring fouling of the test membrane ~~[24]~~ through the inspection window ~~[20]~~ as an indicating means for determining fouling of the semi-permeable membrane ~~[24]~~ in the water purification system.

35. (Currently amended) The method according to claim 34 wherein the method comprises the step of effecting at least partial passage of feed fluid through the test membrane ~~[24]~~ under conventional system operating conditions such that fouling of the semi-permeable membrane ~~[24]~~ is monitored during operation of the water purification system.

36. (Currently amended) The method according to ~~claims 34 and~~ either claim 34 or claim 35 wherein the method particularly concerns monitoring fouling of a semi-permeable spiral membrane ~~[24]~~ in a spiral reverse osmosis water purification system.

37. (Currently amended) The method according to claim 34 wherein the test membrane ~~[24]~~ is removably placed on the support member ~~[16]~~ and is spaced from the support member ~~[16]~~ by means of spacer means.

38. (Currently amended) The method according to ~~claims 34 and~~ either claim 34 or claim 37 wherein the test membrane ~~[24]~~ is any suitable flat-sheet semi-permeable membrane~~, such as a micro-filtration, ultra-filtration, nanno-filtration or the like reverse osmosis membrane, and in particular, is any type of flat-sheet semi-permeable membrane [24]~~ associated with a polymeric support material used in the monitoring unit ~~[10]~~.

39. (Currently amended) The method according to claim 34 wherein fouling of the test membrane ~~[24]~~ is also monitored by means of monitoring equipment, ~~such as~~ selected from the group consisting of laser beam or infrared refraction, or sound acoustics.

40. (Currently amended) The method according to claim 34 wherein flux or passage of pure water through the semi-permeable test membrane ~~[24]~~ is measured by maintaining flow and pressure constant through the monitoring unit ~~[10]~~, the arrangement being such that any deviation in the flux through the test membrane ~~[24]~~ is attributable to adsorption of impurities onto the test membrane ~~[24] (fouling or biofouling)~~, which changes the permeability characteristic of the test membrane ~~[24]~~.

41. (Currently amended) The use of a monitoring unit ~~[10]~~ including a semi-permeable test membrane ~~[24]~~ for evaluating, by visual and physical inspection, one or more of the following operating parameters in a water purification system, namely the efficiency of different types of chemicals utilized in the system, such as anti-scalants, biocides and anti-fouling chemicals; the effect of using different membranes and/or associated spacer means in the water purification system on the operating efficiency of the system; and efficiency of different membrane cleaning methods wherein the

monitoring unit is located in-line with the water purification system and the operating conditions of the water purification system are simulated in the monitoring unit.

42. (Currently amended) The use of a monitoring unit [~~10~~] for evaluating, by visual and physical inspection, one or more of the following parameters in a spiral membrane reverse osmosis water purification system, namely: fouling of the spiral membrane; the efficiency of different types of chemicals utilized in the system, such as anti-scalants, biocides and anti-fouling chemicals; the effect of using different membranes and/or associated spacer means in the water purification system on the operating efficiency of the system; and efficiency of different membrane cleaning methods, wherein the monitoring unit [~~10~~] comprises a flow chamber [~~12~~] having an inlet for permitting ingress of a feed fluid into the flow chamber [~~12~~], the arrangement being such that ~~the~~ a test membrane [~~24~~] is at least partly supported in the flow chamber [~~12~~]; at least one fluid outlet [~~18~~] arranged in fluid communication with the flow chamber [~~12~~] for permitting egress of fluid from the monitoring unit [~~10~~] after having passed through the test membrane; and an inspection window [~~20~~] for permitting visual inspection of the ~~semi-permeable~~ test membrane [~~24~~], the use being characterized in that the monitoring unit is located in-line with the spiral membrane reverse osmosis water purification system and the operating conditions of the water purification system are simulated in the monitoring unit.

43. (Currently amended) A water purification system including at least one water-cleaning unit, the water purification system characterized therein that it includes a monitoring unit [~~10~~] that comprises a flow chamber [~~12~~] having an inlet [~~14~~] for permitting ingress of a feed fluid into the flow chamber [~~12~~], the arrangement being such

that the membrane ~~[24]~~ is at least partly supported in the flow chamber ~~[12]~~; at least one fluid outlet arranged in fluid communication with the flow chamber ~~[12]~~ for permitting egress of fluid from the monitoring unit ~~[10]~~ after having passed through the membrane ~~[24]~~; and an inspection window ~~[20]~~ for permitting visual inspection of the ~~semi-permeable~~ membrane ~~[24]~~, the membrane being a semi-permeable membrane.

44. (Currently amended) The use of a monitoring unit ~~[10]~~ in a water purification system wherein the monitoring unit ~~[10]~~ comprises a flow chamber ~~[12]~~ having an inlet ~~[14]~~ for permitting ingress of a feed fluid into the flow chamber ~~[12]~~, the arrangement being such that a semi-permeable membrane ~~[24]~~ is at least partly supported in the flow chamber ~~[12]~~; at least one fluid outlet ~~[18]~~ arranged in fluid communication with the flow chamber ~~[12]~~ for permitting egress of fluid from the monitoring unit ~~[10]~~ after having passed through the membrane ~~[24]~~; and an inspection window ~~[20]~~ for permitting visual inspection of the semi-permeable membrane ~~[24]~~, wherein the monitoring unit is located in-line with the water purification system and the operating conditions of the water purification system are simulated in the monitoring unit.

45. (New) The monitoring unit according to claim 10 wherein the monitoring unit further comprises at least a second semi-permeable membrane adjacent the semi-permeable membrane, and the spacer means provides a flow space between the adjacent membranes and the support member.

46. (New) The monitoring unit according to claim 11 wherein the spacer means is a feed-side spacer located on top of the semi-permeable membrane.